国际原子能机构
情况通报

INF

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成员国1996年10月17日关于出口核材料和某几类设备及其他材料的信函

1. 兹将随附的1999年5月14日以INFCIRC/209/Rev.1/Mod.4印发的文件的修正件以INFCIRC/209/Rev.1/Mod.4/Corr.1重新印发。

2. 本修正使该文件与修改INFCIRC/209的通常格式相一致。此外，修订后的文件包括INFCIRC/209/Rev.1/Mod.4中未提到的3个成员国的信函的细节。

99-02239

成员国1996年10月17日关于出口核材料和某几类设备及其他材料的信函

1. 国际原子能机构总干事收到了以下各国常驻机构代表1996年10月17日关于出口核材料和某几类设备及其他材料的信函：阿根廷、澳大利亚、奥地利、比利时、保加利亚、加拿大、捷克共和国、丹麦、芬兰、法国、德国、希腊、匈牙利、爱尔兰、意大利、日本、大韩民国、卢森堡、荷兰、挪威、波兰、葡萄牙、罗马尼亚、俄罗斯联邦、斯洛伐克共和国、南非、西班牙、瑞典、瑞士、联合王国和美利坚合众国。

2. 遵照各信函末尾所表达的愿望，现将信函全文（英文）附后。

LETTER

Vienna, 17 October 1996

Sir,

I have the honour to refer to relevant previous communications from the Resident Representative of [Member State] to the International Atomic Energy Agency.

In the years since the procedures described in INFCIRC/209 were formulated for the export of certain categories of equipment and material especially designed or prepared for the processing, use or production of special fissionable material, developments in nuclear technology have brought about the need to clarify parts of the Trigger List originally incorporated in Memorandum B of INFCIRC/209. Such clarifications have been covered in INFCIRC/209/Mods. 1, 2, 3, and 4 (consolidated in INFCIRC/209/Rev. 1) and in INFCIRC/209/Rev. 1/Mod. 1, Mod. 2 and Mod. 3.

My Government now thinks it desirable to further clarify those parts of the Trigger List which refer to reactors, non-nuclear materials and fuel fabrication. I therefore wish to inform you that the existing sections 1, 2 and 4 and the title of section 6 of the Annex to INFCIRC/209/Rev. 1 (Clarification of Items on the Trigger List as amended by subsequent modifications), should be replaced by the text set out in the attachment to this letter; and a new sub-section 6.8 should be added, including the explanatory note, also set out in the attachment.

As hitherto, my Government reserves to itself the right to exercise discretion with regard to the interpretation and implementation of the procedures and the right to control, if it wishes, the export of relevant items other than those specified in the aforementioned attachment to this letter.

[The Government of (Member State) so far as trade within the European Union is concerned, will implement these procedures in the light of its commitments as a Member State of that Union.][1]

I should be grateful if you would circulate the text of this letter and its attachment to Member States for their information.

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[1] This paragraph is included only in the letters sent by the Governments of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom of Great Britain and Northern Ireland.

1. Nuclear reactors and especially designed or prepared equipment and components therefor

1.1. Complete nuclear reactors

Nuclear reactors capable of operation so as to maintain a controlled self-sustaining fission chain reaction, excluding zero energy reactors, the latter being defined as reactors with a designed maximum rate of production of plutonium not exceeding 100 grams per year.

EXPLANATORY NOTE

A "nuclear reactor" basically includes the items within or attached directly to the reactor vessel, the equipment which controls the level of power in the core, and the components which normally contain or come in direct contact with or control the primary coolant of the reactor core.

It is not intended to exclude reactors which could reasonably be capable of modification to produce significantly more than 100 grams of plutonium per year. Reactors designed for sustained operation at significant power levels, regardless of their capacity for plutonium production, are not considered as "zero energy reactors".

EXPORTS

The export of the whole set of major items within this boundary will take place only in accordance with procedures of the Memorandum. Those individual items within this functionally defined boundary which will be exported only in accordance with the procedures of the Memorandum are listed in paragraphs 1.2. to 1.10. Pursuant to paragraph 6 of the Memorandum, the Government reserves the right to apply the procedures of the Memorandum to other items within the functionally defined boundary.

1.2. Nuclear reactor vessels

Metal vessels, or as major shop-fabricated parts therefor, especially designed or prepared to contain the core of a nuclear reactor as defined in paragraph 1.1. above, as well as relevant reactor internals as defined in paragraph 1.8. below.

EXPLANATORY NOTE

The reactor vessel head is covered by item 1.2. as a major shop-fabricated part of a reactor vessel.

1.3. Nuclear reactor fuel charging and discharging machines

Manipulative equipment especially designed or prepared for inserting or removing fuel in a nuclear reactor as defined in paragraph 1.1. above.

EXPLANATORY NOTE

The items noted above are capable of on-load operation or of employing technically sophisticated positioning or alignment features to allow complex off-load fuelling operations such as those in which direct viewing of or access to the fuel is not normally available.

1.4. Nuclear reactor control rods

Especially designed or prepared rods, support or suspension structures therefor, rod drive mechanisms or rod guide tubes to control the fission process in a nuclear reactor as defined in paragraph 1.1. above.

1.5. Nuclear reactor pressure tubes

Tubes which are especially designed or prepared to contain fuel elements and the primary coolant in a reactor as defined in paragraph 1.1. above at an operating pressure in excess of 50 atmospheres.

1.6. Zirconium tubes

Zirconium metal and alloys in the form of tubes or assemblies of tubes, and in quantities exceeding 500 kg for any one recipient country in any period of 12 months, especially designed or prepared for use in a reactor as defined in paragraph 1.1. above, and in which the relation of hafnium to zirconium is less than 1:500 parts by weight.

1.7. Primary coolant pumps

Pumps especially designed or prepared for circulating the primary coolant for nuclear reactors as defined in paragraph 1.1. above.

EXPLANATORY NOTE

Especially designed or prepared pumps may include elaborate sealed or multi-sealed systems to prevent leakage of primary coolant, canned-driven pumps, and pumps with inertial mass systems. This definition encompasses pumps certified to NC-1 equivalent standards.

1.8 Nuclear reactor internals

"Nuclear reactor internals" especially designed or prepared for use in a nuclear reactor as defined in paragraph 1.1. above, including support columns for the core, fuel channels, thermal shields, baffles, core grid plates, and diffuser plates.

EXPLANATORY NOTE

"Nuclear reactor internals" are major structures within a reactor vessel which have one or more functions such as supporting the core, maintaining fuel alignment, directing primary coolant flow, providing radiation shields for the reactor vessel, and guiding in-core instrumentation.

1.9 Heat exchangers

Heat exchangers (steam generators) especially designed or prepared for use in the primary coolant circuit of a nuclear reactor as defined in paragraph 1.1. above.

EXPLANATORY NOTE

Steam generators are especially designed or prepared to transfer the heat generated in the reactor (primary side) to the feed water (secondary side) for steam generation. In the case of a liquid metal fast breeder reactor for which an intermediate liquid metal coolant loop is also present, the heat exchangers for transferring heat from the primary side to the intermediate coolant circuit are understood to be within the scope of control in addition to the steam generator. The scope of control for this entry does not include heat exchangers for the emergency cooling system or the decay heat cooling system.

1.10 Neutron detection and measuring instrumentation

Especially designed or prepared neutron detection and measuring instruments for determining neutron flux levels within the core of a reactor as defined in paragraph 1.1. above.

EXPLANATORY NOTE

The scope of this entry encompasses in-core and ex-core instrumentation which measure flux levels in a large range, typically from 10^4 neutrons per cm^2 per second to 10^{10} neutrons per cm^2 per second or more. Ex-core refers to those instruments outside the core of a reactor as defined in paragraph 1.1. above, but located within the biological shielding.

2. Non-nuclear materials for reactors

2.1. Deuterium and heavy water

Deuterium, heavy water (deuterium oxide) and any other deuterium compound in which the ratio of deuterium to hydrogen atoms exceeds 1:5000 for use in a nuclear reactor as defined in paragraph 1.1. above, in quantities exceeding 200 kg of deuterium atoms for any one recipient country in any period of 12 months.

2.2 Nuclear grade graphite

Graphite having a purity level better than 5 parts per million boron equivalent and with a density greater than 1.50 g/cm^3 for use in a reactor as defined in paragraph 1.1. above, in quantities exceeding 30 metric tons for any one recipient country in any period of 12 months.

EXPLANATORY NOTE

For the purpose of export control, the Government will determine whether or not the exports of graphite meeting the above specifications are for nuclear reactor use.

Boron equivalent (BE) may be determined experimentally or is calculated as the sum of BE_Z for impurities (excluding BE_{carbon} since carbon is not considered an impurity) including boron, where:

BE_Z (ppm) = CF x concentration of element z (in ppm); CF is the conversion factor: ($ó_Z$ x A_B) divided by ($ó_B$ x A_Z); $ó_B$ and $ó_Z$ are the thermal neutron capture cross sections (in barns) for naturally occurring boron and element Z respectively; and A_B and A_Z are the atomic masses of naturally occurring boron and element Z respectively.

4. Plants for the fabrication of nuclear reactor fuel elements, and equipment especially designed or prepared therefor

INTRODUCTORY NOTE

Nuclear fuel elements are manufactured from one or more of the source or special fissionable materials mentioned in Part A of this annex. For oxide fuels, the most common type of fuel, equipment for pressing pellets, sintering, grinding and grading will be present. Mixed oxide fuels are handled in glove boxes (or equivalent containment) until they are sealed in the cladding. In all cases, the fuel is hermetically sealed inside a suitable cladding which is designed to be the primary envelope encasing the fuel so as to provide suitable performance and safety during reactor operation. Also, in all cases, precise control of processes, procedures and equipment to extremely high standards is necessary in order to ensure predictable and safe fuel performance.

EXPLANATORY NOTE

Items of equipment that are considered to fall within the meaning of the phrase "and equipment especially designed or prepared" for the fabrication of fuel elements include equipment which:

a) normally comes in direct contact with, or directly processes, or controls, the production flow of nuclear material;
b) seals the nuclear material within the cladding;
c) checks the integrity of the cladding or the seal; or
d) checks the finish treatment of the sealed fuel.

Such equipment or systems of equipment may include, for example:

1) fully automatic pellet inspection stations especially designed or prepared for checking final dimensions and surface defects of fuel pellets;
2) automatic welding machines especially designed or prepared for welding end caps onto the fuel pins (or rods);
3) automatic test and inspection stations especially designed or prepared for checking the integrity of complete fuel pins (or rods).

Item 3 typically includes equipment for: a) x-ray examination of pin (or rod) end cap welds, b) helium leak detection from pressurized pins (or rods), and c) gamma-ray scanning of the pins (or rods) to check for correct loading of the fuel pellets inside.

6. Plants for the production or concentration of heavy water, deuterium and deuterium compounds and equipment especially designed or prepared therefor

6.8. Complete heavy water upgrade systems or columns therefore

Complete heavy water upgrade systems, or columns therefore, especially designed or prepared for the upgrade of heavy water to reactor-grade deuterium concentration.

EXPLANATORY NOTE

These systems, which usually employ water distillation to separate heavy water from light water, are especially designed or prepared to produce reactor-grade heavy water (i.e. typically 99.75% deuterium oxide) from heavy water feedstock of lesser concentration.